

naper is a continuation by M. Mougin of his report of June, 1903, and deals with the results obtained from the seven instruments placed at appointed stations between the village of Houches and the Aiguille du Goûter. Unfortunately, the snow-gauge placed on the Aiguille du Goûter was destroyed by a party of young students from Geneva who attempted the ascent of Mont Blanc without guides in 1902. On the Tête-Rousse, again, the instrument was found completely empty; fortunately, however, the platform snow-recorder, placed on the glacier, enabled an estimate of the snowfall to be made.

The general results derived from the records of these seven stations show that between 1000 metres and 3200 metres the snowfall increases with altitude, but the results are not altogether satisfactory. Thus the record at 2100 metres gives a fall equivalent to 0.3194 mm. of water only, whereas the stations above and below show falls of 1.848 mm. and 0.491 mm. respectively.

Even if the upper station is excessive, the station above at 2850 metres at the Pierre-Rondestill shows an increase, being 0.4461 mm.; it is possible, therefore, that the mouth of the instrument has become blocked by a film of verglas. With regard to the large fall recorded at 2550 metres, it is possible that here we have the altitude at which the greatest precipitation takes place. The loss of the instrument at the summit of the Aiguille du Goûter is all the more to be regretted on this account, as it would undoubtedly have thrown light on this point, and it is to be hoped that the instrument may speedily be replaced.

The report gives a detailed description of the instruments used. These consisted of horizontal boards placed one metre above the ground, and also of Vallot's snow-gauges of a modified design.

Comparative experiments were made during the winter at Chambéry between the official rain-gauge, the Vallot tubes, and the snow-table. The results are expressed in tables and by curves. No useful comparisons could be made between the rain-gauge and the Vallot tubes, but the results obtained with the latter instrument are compared with those obtained with the snow-table, and are expressed both in depth of snow and amount of water melted. The small number of snowstorms during the winter of 1902-3 was also unfavourable to any definite conclusion being arrived at; further experiments are required.

The report ends with tables showing the snowfall and number of avalanches which fell in Savoy during 1902, also the damage done to forests, roads, and water-courses, and accidents to men and animals.

Another report received from the Commission française des Glaciers deals with the observations by M. Paul Girardin on the glaciers of Maurienne, Vanoise, and Tarentaise during August and September, 1903, and also with the glaciers of the massif of La Vanoise in 1903, by J. A. Favre (Extrait de l'Annuaire du Club Alpin français, vol. xxx., 1903). M. Girardin arrives at the conclusion that these glaciers are retreating, the amount varying in different glaciers and even in different lobes of the same glacier. The general law is, therefore, complicated by local shade, &c. Retreat is most marked where surface moraines are absent, while those covered thickly with débris are more stationary. The rate of retreat has, however, diminished during the last ten years.

In the massif of the Vanoise we find the same story. Glaciers like the Grands-Couloirs, Pelvoz, &c., are all losing in thickness. In the case of the Pelvoz a new medial moraine has appeared owing to the marked ablation, while a glacier marked on the map north of the Col d'Aussois has completely disappeared.

E. J. G.

INTERNATIONAL METEOROLOGICAL CONFERENCE AT INNSBRUCK.

*Second and Third Meetings.*¹

AMONG the various points brought under notice, the president, Dr. Pernter, stated that M. Violle wished that his proposals made to the meeting at Southport on the question of solar radiation should be discussed. After considerable deliberation, it was resolved that the principal observatories should be requested to make observations of solar and terrestrial radiation. Measurements should be made daily, those of solar radiation at 11h. a.m. or from 11h. a.m. to 1h. p.m., and those of terrestrial radiation at 10h. p.m. or from 10h. p.m. to 12h. p.m. The apparatus used should be exclusively Angström's compensation actinometer.

Upon the subject of excessive rainfall, Dr. Landa, of the k.k. hydrographisches Central-Bureau (Vienna), proposed (1) that meteorological offices should be invited to inquire into the causes of origin of cases of excessively heavy rainfall over large areas, including those which have already occurred, and any that may occur in future, in the districts under their supervision, and to publish the results of their investigations, and (2) that it should be recognised as useful to investigate the historical documents of various countries for particulars of abnormal meteorological occurrences, such as floods, droughts, very severe winters, &c., and to classify and publish the results of their researches.

The classification of meteorological stations, according to the nature of the work carried out, was referred to the International Meteorological Committee, as was also the definition of such phenomena as hoarfrost, silver-thaw, glazed frost, &c.

On the important question of long series of homogeneous observations, necessary for the study of secular variations, the conference adopted Dr. Hellmann's proposal that central meteorological offices should establish in their respective organisations one or more secular stations, according to the extent of the country, and should carry on the observations as uniformly and continuously as possible. At the same time, the conference expressed the hope that old series of observations might be critically discussed and published.

On the proposal of M. Rosenthal, the conference requested General Rykatcheff to undertake, on the part of the Central Physical Observatory, St. Petersburg, the publication of a summary of the results of observations made during the last century. Dr. Hellmann was requested to assist in the preparation of this useful work.

Prof. von Bezold raised the question of the status of the conferences of directors, and of the International Meteorological Committee; he thought they should maintain an official character, so far as possible, and that the number of meetings should be as few as practicable. After considerable discussion, a proposal by Dr. Hellmann was adopted, viz. that the conference should request the International Meteorological Committee to draw up a standing order relating to the International Meteorological Organisation, at the same time taking note of the historical development of the committee. This rule, dealing with conferences of directors, the international committee, and the subcommittees, should be submitted to the next conference of directors for discussion.

M. Froc made a communication respecting the organisation of the meteorological service of the

¹ An account of the opening meeting appeared in NATURE of September 21 (p. 510).

Chinese Maritime Customs. We have not yet received the protocol of the last meeting, but we may state that it included reports of the various commissions.

With regard to the Solar Commission appointed in 1903, complete arrangements were made for bringing together all data necessary for the study of simultaneous solar and terrestrial changes. Letters had been received from Prof. Hale and M. Deslandres placing their photospectroscopic results at the disposal of the commission.

INTERNATIONAL UNION FOR COOPERATION IN SOLAR RESEARCH.

AT last the importance of solar research is asserting itself, even in the minds of some who in the past have shown it scant favour. It is not a little remarkable that during last month two international bodies held meetings, both of them concerned with solar observations, the one, the Solar Commission, established in 1903, which met at Innsbruck, dealing with them in relation to the meteorological changes on the earth, the other, the Solar Union, established in 1904, which met at Oxford, dealing with the physics of the sun itself. There is thus fortunately a sharp-cut line between these two efforts to advance our knowledge, and we hope that both bodies will ultimately find out the best ways of doing this. In a preliminary circular we read:—

The number of international organisations having considerably increased lately, it is desirable that overlapping of the work of different organisations should be avoided as much as possible. As far as solar research is concerned, a committee on questions dealing with radiation and the connection of solar and terrestrial phenomena has been appointed by the International Meteorological Committee. It will probably be found advisable to omit for the present the investigation of the relation of the sun-spot cycle to meteorological phenomena from the programme of the union; but the question of the solar constant being of fundamental importance must form from the beginning an essential portion of its work. The astronomical and meteorological aspects of solar radiation are, however, very different, and there is no reason to doubt that some arrangement can be made by which the efforts of the Meteorological Committee and those of the Union on Solar Research may be united.

We have not yet received the official protocols of the Oxford meeting, but some points may be referred to. The meeting was well attended, the following foreign men of science being present:—Prof. K. Ångström, Acad. Sci. (Stockholm); Prof. A. Belopolski, Acad. Sci. (St. Petersburg); Fr. Cirera, Ast. Soc. of France; Cte. de la Baume Pluvinel, Ast. Soc. of France; Mr. H. Deslandres, Ast. Soc. of France; Prof. W. S. Eichelberger; Mr. Fabry, Physical Soc. of France; Mr. G. E. Hale, Nat. Acad. Sci. (Washington); Mr. Hansky, Acad. Sci. (St. Petersburg); Mr. J. Janssen, Acad. Sci. (France); Prof. W. H. Julius, Acad. Sci. (Amsterdam); Prof. H. Kayser, German Physical Soc.; Mr. Perot, Physical Soc. of France; Prof. E. Weiss, Internat. Assoc. Acad.; Prof. Wolfer.

Dr. Janssen was elected honorary president, and Sir Wm. Christie president, of the meeting.

Among the many resolutions passed were the following, laying down the principles which should be followed in the proposed cooperation:—

(1) Cooperation is desirable in the various branches of solar research such as visual and photographic observations of the solar surface, visual observations of prominences and observations of the solar atmosphere with spectroheliographs of various types.

(2) When an institution has collected and coordinated results from various sources, members of the union shall

be requested to place their observations at the disposal of the said institution.

(3) In the case of investigations which have not yet been thus collected and coordinated, special committees specially nominated by the union shall be charged with the work of preparing and carrying out the needful cooperation.

(4) It is proposed forthwith to organise such cooperation in two branches of research:—

(a) The study of the spectra of sun-spots.

(b) The study of the records, by means of the H and K light, of the phenomena of the solar atmosphere.

(5) The committee lays special stress on the fact that, notwithstanding the obvious utility of cooperation in certain cases, individual initiative is the chief factor in a very large number. It is as much the duty of the union to encourage original researches as to promote cooperation.

Much time was spent in discussing the constitution of the union, and several committees were appointed. There were most interesting discussions on solar radiation, Prof. Ångström describing his instrument which has now been taken as the standard, and we may add that as this subject is also dealt with by the International Meteorological Committee, Prof. Ångström has been appointed chairman of the committees appointed by both organisations. The executive is to consist of a committee with Prof. Schuster as chairman, and a "computing bureau" is suggested at Oxford in charge of Prof. Turner, which is to deal, if necessary, with classes of observations not already provided for.

The next meeting is to be held at Meudon in two years' time.

NOTES.

WE notice with much regret that Sir William Wharton, K.C.B., F.R.S., died at Cape Town on September 29 from enteric fever and pneumonia, at sixty-two years of age.

WE regret to see, in the *Athenaeum*, the announcement of the death, in his sixty-ninth year, of Dr. W. von Bezold, professor of physics and meteorology at the University of Berlin, and director of the German Meteorological Institute.

THE death is announced of Dr. A. H. Japp, author of a life of Thoreau, several works on natural history, and "Darwin and Darwinism."

THE International Congress on Tuberculosis was opened at Paris on Monday, October 2, by the President of the French Republic. Dr. Hérard, the president of the congress, gave an address on international medical congresses, and the services which they have rendered in the struggle against consumption. Addresses were then given by the foreign delegates, and by M. Loubet.

A REUTER message from Gothenburg reports that a severe shock of earthquake was felt on September 26, 1.30 p.m., at Lundby, in the island of Hisingen. Subterranean rumblings were heard, and the houses suddenly began to rock so violently that inner and outer walls were cracked. The disturbance lasted about a minute.

NEWS has been received from Samoa that a volcanic eruption occurred on the Samoan islands on the morning of August 21. The eruption was preceded by a violent earthquake shock, which destroyed a large number of buildings. During the eruption large masses of material were ejected, and for five days lava flowed over more than four miles of the surrounding country.

IT is officially reported that a case of cholera occurred in Berlin on September 23, the victim being a canal barge-man on one of the Berlin canal harbours.